

CONVEYOR PAN

TECHNICAL FIELD

[0001] The present disclosure relates to mining applications. Particularly, the present disclosure relates to a wear-resistant conveyor pan for use in mining applications, in particular, for a chain scraper conveyor.

BACKGROUND

[0002] In longwall underground mining, a longwall mining installation extends along a longwall face to extract material therefrom, and subsequently advances in a working direction perpendicular to the longwall face. For example, a material winning plow (longwall plow) is guided along a plow guiding assembly attached to a chain scraper conveyor such that the plow reciprocates along the longwall face to extract material.

[0003] During operation, parts of the chain scraper conveyor, in particular, the conveyor pans of the same, are subject to considerable wear. Therefore, the conveyor pans have to be periodically repaired/replaced.

[0004] US 2013/0313887 A1 discloses a linepan section for a longwall mining machine. The linepan section includes a face-side rail, a gob-side rail, and a conveyor pan between the rails. Each rail is formed as a single-piece casting, and the conveyor pan is a substantially flat plate connected to a conveyor pan portion of each rail.

[0005] The present disclosure is directed, at least in part, to improving or overcoming one or more aspects of prior systems.

SUMMARY OF THE DISCLOSURE

[0006] In one aspect, the present disclosure relates to a conveyor pan for use in mining applications, in particular, for a chain scraper conveyor. The conveyor pan comprises a bottom plate and a pair of side profiles configured to be fixed to the bottom plate by welding. Each of the pair of side profiles comprises at least one profile rail extending along a longitudinal direction with a substantially T-shaped cross-section. Each profile rail includes a profile flange extending in a transverse direction and a profile web extending from the profile flange. The profile web includes a recess formed in a distal end of the same. The recess extends from a side surface of the profile web to a bottom surface of the profile web. At least part of the recess extends at an angle of less than 40° with respect to the transverse direction.

[0007] According to another aspect, the present disclosure relates to a conveyor pan for use in mining applications, in particular, for a chain scraper conveyor. The conveyor pan comprises a bottom plate and a pair of side profiles configured to be fixed to the bottom plate by welding. Each of the pair of side profiles comprises at least one profile rail extending along a longitudinal direction with a substantially T-shaped cross-section. Each profile rail includes a profile flange extending in a transverse direction and a profile web extending from the profile flange. The profile web includes a recess formed in a distal end of the same. The recess extends from a side surface of the profile web to a bottom surface of the profile web. A ratio of a width of the bottom surface to a depth of the recess when viewed in a direction perpendicular to the transverse direction is between 0.08 and 0.4, in particular, between 0.13 and 0.37.

[0008] According to another aspect, the present disclosure relates to a profile rail for a conveyor pan. The profile rail is configured to be fixed to a bottom plate of the conveyor pan by welding. The profile rail extends along a longitudinal direction with a substantially T-shaped cross-section and includes a profile flange extending in a transverse direction substantially perpendicular to the longitudinal direction and a profile web extending from the profile flange. The profile web includes a recess formed in a distal end of the same. The recess extends from a side surface of the profile web to a bottom surface of the profile web. At least part of the recess extends at an angle of less than 40° with respect to the transverse direction, and/or a ratio of a width of the bottom surface to a depth of the recess when viewed in a direction perpendicular to the transverse direction is between 0.08 and 0.4, in particular, between 0.13 and 0.37.

[0009] According to yet another aspect, the present disclosure relates to a pocket member for a conveyor pan. The pocket member is configured to be welded to a first profile rail and a second profile rail of a side profile of the conveyor pan. The pocket member is configured to receive a substantially dumbbell-shaped connection member for connecting adjacent conveyor pans. The pocket member includes a continuous base plate and a pair of engagement members protruding from the base plate in an upright manner. The pair of engagement members define an accommodation space for one end of the dumbbell-shaped connection member. The pocket member is symmetrically formed with respect to a central symmetry plane that is perpendicular to the base plate.

[0010] According to a further aspect, the present disclosure relates to a conveyor pan for use in mining applications, in particular, for a chain scraper conveyor. The conveyor pan comprises a bottom plate and a pair of side profiles configured to be fixed to the bottom plate by welding. The bottom plate includes an inspection opening configured to receive an inspection panel. The inspection opening is open at one side and closed at the other side in a transverse direction, and configured to slidably receive the inspection panel from the one side. A chamfered surface is formed in the part of the bottom plate closing the inspection opening on the other side. The chamfered surface extends outward from a top surface to a bottom surface of the bottom plate and is configured to engage with a mating chamfered front edge of the inspection panel. Other features and aspects of this disclosure will be apparent from the following description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The accompanying drawings, which are incorporated herein and constitute a part of the specification, illustrate exemplary embodiments of the disclosure and, together with the description, serve to explain the principles of the disclosure. In the drawings:

[0012] FIG. 1 shows a cross-sectional view of a conveyor pan of a chain scraper conveyor according to the present disclosure;

[0013] FIG. 2 shows a detailed cross-sectional view of a profile rail configured to be welded to a bottom plate of the conveyor pan according to the present disclosure;

[0014] FIG. 3 is an exemplary cross-section showing a geometry of a profile rail according to the present disclosure;